PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference ABD-001	FOR FURTHER ACTION	See Form PCT/IPEA/416
International application No. PCT/US04/11068	International filing date *(day/month/year)* 09 April 2004 (09.04.2004)	Priority date *(day/month/year)* 22 April 2003 (22.04.2003)
International Patent Classification (IPC) or national classification and IPC IPC(7): G05F 1/44 and US Cl.: 323/282		
Applicant DOWLATABADI, AHMAD B.		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 4 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:

a. ☐ *(sent to the applicant and to the International Bureau)* a total of ___ sheets, as follows:

☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).

☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.

b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s))

_____ , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

Date of submission of the demand	Date of completion of this report
14 February 2005 (14.02.2005)	18 May 2005 (18.05.2005)
Name and mailing address of the IPEA/ US Mail Stop PCT, Attn: IPEA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230	Authorized officer Michael Sherry Telephone No. (571) 272-2800

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/US04/11068

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on translations from the original language into the following language _____, which is the language of a translation furnished for the purposes of:

☐ international search (under Rules 12.3 and 23.1(b))

☐ publication of the international application (under Rule 12.4)

☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

☒ the international application as originally filed/furnished

☒ the description:
pages 1-17 as originally filed/furnished
pages* NONE received by this Authority on _____
pages* NONE received by this Authority on _____

☒ the claims:
pages 18-21 as originally filed/furnished
pages* NONE as amended (together with any statement) under Article 19
pages* NONE received by this Authority on _____
pages* NONE received by this Authority on _____

☒ the drawings:
pages 1/6-6/6 as originally filed/furnished
pages* NONE received by this Authority on _____
pages* NONE received by this Authority on _____

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____
☐ the claims, Nos. _____
☐ the drawings, sheets/figs _____
☐ the sequence listing (*specify*): _____
☐ any table(s) related to the sequence listing (*specify*): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

☐ the description, pages _____
☐ the claims, Nos. _____
☐ the drawings, sheets/figs _____
☐ the sequence listing (*specify*): _____
☐ any table(s) related to the sequence listing (*specify*): _____

** If item 4 applies, some or all of those sheets may be marked "superseded."*

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/US04/11068

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims 15	YES
	Claims 1-14	NO
Inventive Step (IS)	Claims NONE	YES
	Claims 1-15	NO
Industrial Applicability (IA)	Claims 1-15	YES
	Claims NONE	NO

2. Citations and Explanations (Rule 70.7)
Please See Continuation Sheet

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

V. 2. Citations and Explanations:

Claims 1-14 lack novelty under PCT Article 33(2) as being anticipated by the admitted prior art figure 1 in view of Werrback (US 5,485,077) and further in view of Rozenblit et al (US 6,466,069).

Claim 1; APA figure 1 discloses a regulation loop for a switching power converter having a pulse width variable modulator operating switches (M1, M2); a bridge filter section (Lo, Co), with a power output node feeding a load, the bridge filter section having a first transfer function with inherent poles and zeros; a comparator (23) having a high impedance first input sampling a voltage from the power output node of the switching power converter as a first input signal and having a second input signal from a reference supply representing a target voltage level for the load, the comparator having an output signal on an output line with a high or low signal depending on whether first input signal exceeds the second input signal.

However, the APA figure 1 does not disclose a filter connected to the comparator receiving the comparator output signal and to deliver a filter output signal, the filter having a second order transfer function, the second order transfer function established by a selection of filter components offsetting the poles and zeros of the first transfer function, operating the variable parameter of the pulse width variable.

Werrback teaches a comparator (20) and filter (19) receiving a comparator output signal (see also col. 2 lines 6-16).

However, Werrbach do not disclose the filter having a second order transfer function.

Second order filters are common and well known in the art. Rozenblit et al teaches a loop filter that utilizes a second order filter; such a loop filter integrates the current pulses and provides a steady DC voltage.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the APA figure 1 to include a filter connected to the comparator receiving the comparator output signal and to deliver a filter output signal as taught by Werrbach in order to compensate for a change in the output characteristics of the converter and it would have been obvious to use a filter having a second order transfer function, the second order transfer function established by a selection of filter components for offsetting the poles and zeros of the first transfer function as taught by Rozenblit et al in order to provide a steady DC voltage.

Claims 2-8; Rozenblit et al teach using a charge pump connected to a filter with capacitors and a resistor for biasing the filter by adding and subtracting charge from the capacitors.

Claim 9-14; APA figure 1 discloses a regulation loop for a switching power converter having a pulse width variable modulator operating switches; and a bridge filter section, with a power output node feeding a load, the variable parameter of the modulator establishing an amount of regulation and efficiency of the power converter, comprising: a comparator (23) having a high impedance first input sampling a voltage from the power output node of the switching power converter as a first input signal and having a second input signal from a reference supply representing a target voltage level for the load, the comparator having an output

Supplemental Box

signal on an output line with a high or low signal depending on whether first input signal exceeds the second input signal or not.

However, the APA figure 1 does not disclose a charge pump connected to receive the output signal from the comparator and either source or sink current in response thereto as a current signal; and a filter connected to the comparator receiving the current signal and delivering a filter output signal operating a pulse width variable modulator.

Rozenblit et al teach a charge pump connected to a filter comprising capacitors and resistors for biasing the filter by adding and subtracting charge from the capacitor(s).

Werrbach teach a comparator (20) and filter (19) receiving the comparator output signal.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the APA figure 1 to include a charge pump connected to receive the output signal from the comparator and either source or sink current in response thereto as a current signal as taught by Rozenblit et al in order to provide a steady DC voltage; and it would have been obvious to use a filter connected to the comparator receiving the current signal and delivering a filter output signal operating a pulse width variable modulator as taught by Werrbach in order to compensate for a change in the output characteristics of the converter.

Claim 15 lacks an inventive step under PCT Article 33(3) as being obvious over admitted prior art figure 1, Werrback (US 5,485,077) and Rozenblit et al (US 6,466,069) in view of Ito et al (US 5,502,629).

Claim 15; APA figure 1, Boylan et al and Rozenblit et al disclose the claimed subject matter in regards to claim 9 supra, except for the charge pump comprises an inverter arrangement of MOS transistors, with a pair of bias transistors connected to the inverter arrangement.

Ito et al teaches charge pump details including mos transistors and bias transistors and inverters.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a charge pump with inverters, mos transistors and bias transistors in order to boost the efficiently and in a stable manner.